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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/090,073	03/01/2002	Pary Baluswamy	MIC-20	4253

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EXAMINER

MOHAMEDULLA, SALEHA R

ART UNIT	PAPER NUMBER
1756	

DATE MAILED: 03/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/090,073

Applicant(s)

BALUSWAMY ET AL.

Examiner

Saleha R. Mohamedulla

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) 31-60 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 030102.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Claims 1-60 are pending.

Election/Restriction

The Applicant's election of Group I, claims 1-30, in the Paper filed February 2, 2004 is acknowledged. Because the Applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claims 1-30 are considered and claims 31-60 are withdrawn from consideration.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3, 7, 8, 10, 11, 14, 15, 17, 18, 21, 22, 24, 25, 28 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by US# 6,114,095 to Nakabayashi et al.

Nakabayashi teaches a phase shifting mask with transmitting portions including first transmitting areas periodically arranged along a first direction and a second direction and a second transmitting area provided in an area surrounded with adjacent four first transmitting

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areas (Abstract). Nakabayashi teaches in Figure 1, a phase shifting mask including a transparent photomask plate of glass or the like, an opaque portion formed in the transparent photomask and transmitting portions formed in the transparent photomask plate (col. 4, lines 60-67). Figure 11 shows a sectional view. Nakabayashi teaches a transparent substrate having etched portions and an opaque patterned layer on the substrate. Figure 1 shows that the features are similar in size and that some features are in a nonuniform repetitive dense pattern. Therefore, Nakabayashi teaches the claim limitations.

3. Claims 1-30 are rejected under 35 U.S.C. 102(e) as being anticipated by US# 6,258,489 to Stanton et al.

Stanton teaches a photomask including dummy features adjacent to printable features. The dummy features are smaller than the resolution of the exposure system so that the dummy features will not be printed on the substrate below (Abstract). Figure 1 shows a mask with an isolated printable contact opening surrounded by dummy openings (col. 3, lines 1-15). In addition, Stanton teaches that the dummy opening size should be less than one third of the exposure wavelength (col. 3, lines 35-40). Stanton teaches phase shifting masks (col. 4, lines 10-20). Stanton teaches that each dummy opening includes a central non-transmissive island disposed within a transmissive portion (col. 3, lines 5-15). Stanton also teaches that the portions of the mask referred to as transmissive and non-transmissive may be reversed. Non-transmissive portions are those covered by an opaque coating (col. 3, lines 15-25). As shown in the figures, part of the dummy contact feature is smaller than the printable feature, that is, if the dummy contact feature is unshaded and the printable feature is shaded. Also, the dummy contact feature

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is the same size as the printable feature, that is, if the dummy contact feature is the unshaded portion along with the shaded border. For example, the entire square 210 is the size of the entire square 220. Therefore, Stanton teaches the limitations of the claims.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4-6, 9, 12, 13, 16, 19, 20, 23, 26, 27 and 30 rejected under 35 U.S.C. 103(a) as being unpatentable over US# 6,114,095 to Nakabayashi et al. in view of US# 6,258,489 to Stanton et al.

Nakabayashi teaches the limitations discussed above. Nakabayashi does not teach that features on the mask do not print or form on an underlying substrate. Stanton teaches a photomask including dummy features adjacent to printable features. The dummy features are smaller than the resolution of the exposure system so that the dummy features will not be printed on the substrate below (Abstract). Figure 1 shows a mask with an isolated printable contact opening surrounded by dummy openings (col. 3, lines 1-15). In addition, Stanton teaches that the dummy opening size should be less than one third of the exposure wavelength (col. 3, lines 35-40). Stanton teaches phase shifting masks (col. 4, lines 10-20).

The references are analogous art as they are both drawn to phase shift photomasks used to form contact hole patterns in underlying substrates. It would be obvious to one of ordinary

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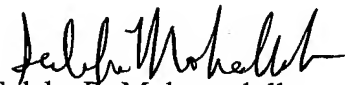
skill in the art to form one set of features in the Nakabayashi mask smaller than the wavelength of radiation as in the mask of Stanton in order to improve printing as the dummy features will act to suppress sidelobes and/or increase the depth of focus (Stanton; col. 2, lines 5-15).

Conclusion

6. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Saleha Mohamedulla whose telephone number is (571) 272-1387. The Examiner can normally be reached Monday-Friday, from 8:00 AM to 4:30 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Saleha R. Mohamedulla
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Technology Center 1700
March 3, 2004